Autologous stem cell ovarian transplant to improve ovarian response and reproductive outcomes in poor responder patients

Objective: To evaluate effects of autologous stem cell ovarian transplant (ASCOT) on the ovarian reserve and the IVF outcomes of poor responder (PR) women.

Design: Prospective observational pilot study.

Setting: University Hospital.

Patients: Seventeen PR women.

Interventions: Ovarian infusion of bone marrow derived stem cells.

Main Outcome Measures: Serum anti-müllerian hormone (AMH) levels and antral follicular count (AFC), retrieved oocytes after ovarian stimulation. Aphaeresis samples were analyzed for the concentrations of growth factors released by stem cells.

Results: ASCOT resulted in a significant improvement in AFC two weeks after cell administration. We considered an increase in AFC ≥3 foll. and/or two consecutive increases (2SD) in AMH levels to be successful and observed that ovarian reserve function improved in 81.3% of women. These positive effects were associated with the presence of Fibroblast Growth Factor-2 (FGF-2) and the concentration of Thrombospondin (THSP-1) for an increase in both AFC and AMH. During COS, ASCOT increased the number of stimulable antral follicles and oocytes allowing 4 pregnancies although did not modify embryo euploidy .

Conclusion: Our results suggest that ASCOT optimized the mobilization and growth of the existing follicles in PR. FGF-2 and THSP-1 were key components within aphaeresis that contributed ASCOT success. ASCOT improved oocyte quantity allowing pregnancy in PR women whose only clinical option was oocyte donation.

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